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EXAMINER

ZHENG, EVA Y

ART UNIT PAPER NUMBER

2634

DATE MAILED: 07/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/735,993

Applicant(s)

KATO ET AL.

Examiner

Eva Yi Zheng

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. Figures 1, 2A, 2B, and 2C should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) Regarding claims 1 and 9, on line 10-11, phrase: " modified inphase and quadrature analog data" has failed to specifically define the definition of modified analog data in the claim.

b) Regarding claims 2, 8, and 15-17, render the same problem described above.

4. Claim 21 recites the limitation "the modified inphase" in line 8. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 4, 6, 7, 9, 10, 12, 14, 15, 17, 18, and 20, 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Park et al. (US 6,373,902 B1).

- a) Regarding claims 1, 9, 15, 17, and 21, Park et al. disclose a predetermined error vector magnitude reduction circuit comprising:

an inphase register for storing digital inphase bit patterns (201 in Fig. 7);

a quadrature register for storing digital quadrature bit patterns (203 in Fig. 7);

an inphase digital-to-analog converter (DAC) for converting the digital inphase bit patterns to an inphase analog signal (205 in Fig. 7);

a quadrature DAC for converting the digital quadrature bit patterns to a quadrature analog signal (207 in Fig. 7); and

at least one lookup table (233 in Fig. 7) containing predetermined digital inphase and quadrature bit patterns for comparison with the digital inphase and quadrature bit

patterns stored in the inphase and quadrature registers, and containing modified inphase and quadrature analog data, wherein the modified inphase and quadrature analog data replaces the inphase and quadrature analog signals at the output of the DACs when there is a match between the predetermined digital inphase and quadrature bit patterns stored in the lookup table and the digital inphase and quadrature bit patterns stored in the inphase and quadrature registers (Col 5, L 22-35).

b) Regarding claims 4, 6, 10 and 12, Park et al. disclose the circuit further comprising a storage element for storing the lookup table (233 in Fig. 7; Col 5, L 22-35 ).

c) Regarding claim 7, Park et al. disclose the circuit of claim 1, further comprising an adder for adding the inphase and quadrature analog signals (213 in Fig. 7).

d) Regarding claim 14, Park et al. disclose a transmitter comprising:

a baseband processor for generating inphase and quadrature digital bit patterns ("IchD" and "QchD" as shown in Fig. 7);

a predetermined error vector magnitude (EVM) reduction circuit for converting the inphase and quadrature digital bit patterns to analog signals that minimize EVM by correlating the inphase and quadrature digital bit patterns to known EVM scatter patterns (201, 203, 205, 207, 511, 513, 209, 211, 229, 231, 233, and 237 in Fig. 7);

a mixing stage for mixing the analog signal up to an RF signal (213 in Fig. 7);

a power amplifier for amplifying the RF signal (217 in Fig. 7); and

an antenna for transmitting the RIF signal (225 in Fig. 7).

Art Unit: 2634

e) Regarding claim 18, Park et al. disclose the transmitter of claim 14, wherein the mixing stage comprises a first mixer (213 in Fig. 7) for mixing the analog signal to an intermediate frequency, followed by a second mixer (219 in Fig. 7) wherein the intermediate frequency signal is mixed with an RF carrier to create an RF signal (Col 13, L49-60).

f) Regarding claim 20, Park et al. disclose a method for predetermined error vector magnitude reduction comprising the following steps:

testing to detect overshoot in transitions from one phase state to another at the output of a transmitter (as shown in Fig. 7);

correlating the overshoot to particular error vector magnitude scatter patterns ( 511 and 513 in Fig. 7);

correlating the scatter patterns to particular inphase and quadrature bit patterns (511 and 513 in Fig. 7);

forming a lookup table containing the predetermined inphase and quadrature bit patterns and modified inphase and quadrature data for each of the bit patterns that does not cause overshoot (233 in Fig. 7; Col 5, L 22-35 ); and

using the lookup table to prevent or reduce error vector magnitude at the output of the transmitter (Col 5, L 22-35).

g) Regarding claim 22, Park et al. disclose the method of claim 20, wherein the modified inphase and quadrature data is digital data (201 and 203 in Fig. 7).

h) Regarding claim 23, Park et al. disclose the method of claim 20, wherein the modified inphase and quadrature data is analog data (205 and 207 in Fig. 7).

**Conclusion**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Yi Zheng whose telephone number is 703-305-8699. The examiner can normally be reached on 7:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-879-9306.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231


**or faxed to: (703) 872-9314 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

June 17, 2004

Eva Yi Zheng  
Examiner  
Art Unit 2634

  
**SHUWANG LIU**  
**PRIMARY EXAMINER**